

which then occupied but little space in the cell, has become considerably increased in amount, an increase having also taken place in the length of the cell: at length the process of division, &c. occurs as before, and a second spore is formed adjoining the first. The formation of a third spore involves a similar chain of phænomena.

I am, Gentlemen, your very obedient servant,
G. H. K. THWAITES.

XLV.—*On a species of Semnopithecus from the Peninsula of Malacca.* By THEODOR CANTOR, Esq., M.D., Civil Surgeon, Prince of Wales Island.

To Richard Taylor, Esq.

DEAR SIR,

Library, East India House, April 6, 1846.

[THE first notice of the species of *Semnopithecus* described in the accompanying essay by Dr. Cantor, is given in the 'Proceedings of the Zoological Society' for 1837, p. 14, by Mr. James Reid, who characterized it under the name of *obscurus* from a specimen in the Society's collection; the locality of the particular specimen exhibited was unknown. Temminck subsequently described a *Semnopithec* very concisely with the name of *Semn. leucomystax*, stating doubtfully that the *S. obscurus* of Reid might perhaps belong to the same species. See *Verhandelingen over de Natuurlyke Geschiedenis der Nederlandsche Bezittingen: Monographisch Overzicht van Semnopithecus*, p. 59, no. 4. Mr. Martin, in his 'Natural History of Quadrumana,' gives a more detailed account of the external characters of *Semnopithecus obscurus* of Reid, or the *Dusky Monkey*, referring to some specimens brought from Singapore by Mr. Cuming, and presented by him to the museum of the Zoological Society, and also to a specimen in the Paris museum, adding, that no particular details of the habits of this species had as yet been received; science is therefore indebted to Dr. Cantor for the first satisfactory account of the habits and peculiarities of this monkey, and I submit this essay to your consideration as deserving perhaps a place in the 'Annals of Natural History.'

The 'Proceedings of the Linnean Society' for April 1, 1845, contain the specific character of the *Semnopithecus halonifer*, with a few remarks extracted from Dr. Cantor's more detailed essay.—T. Horsfield.]

Semnopithecus halonifer, Cantor.

S. nitide cinereo-nigrescens; crista occipitis cana, abdomine subalbido; cauda subcinerea; facie, auribus, manibus, pedibus, tuberi-

busque ischiaticis nigris ; palpebris labiisque lacteis, uti halonibus circumdatis, tarsi palpebrarum nigris ; phalangibus digitorum primis membrana inter se junctis.

Juvenis : Pallidior ; crista occipitis cinerea, facie nigro-cærulescenti.
Neonatus : Nitide fulvus.

The colour of the face, ears, hands and feet, and of the ischiatic callosities is intense shining black. The back and external surface of the extremities blackish or dark brownish ash, as well as the chest and the inner side of the extremities. The tail is cylindrical, with a small terminal tuft of a lighter ash-colour. The skin is milky-white, and is left to view on the abdomen, which is thinly covered with ash-coloured hairs. The forehead is completely hidden by hairs, so closely adpressed to the skull, that they appear as if they had been brushed backwards to the occiput, which is covered by a long crest of grayish hairs lying flat down the back, unless agitated by the movements of the head, when they may be said to "stand on end." The eyebrows are prominent, rendered more so by a ridge or bandeau of long, half-erect, diverging, shining black hairs. The eye is dark brown, nearly black, of great brilliancy, heightened by the milky-white colour of the eyelids, which forms a broad halo, bordered by the black tarsus and eyelashes. A similar broad halo is formed by the white lips and chin. These white markings, which are most developed in the young, impart a very singular expression to the physiognomy. The nose is a little prominent. The nostrils open laterally, and the fleshy part between them is elevated.

The lips and chin have a short grayish beard ; the cheeks are covered with long, backwards pointing whiskers, which nearly hide the black, rather large ears. The thumbs of the anterior extremities are very minute. The first phalanges of the four fingers are united by an interdigital membrane sufficiently lax to allow of the fingers being widely separated. This character exists not only in the different species of Gibbons and Monkeys enumerated by the author of 'The Natural History of Monkeys, Opossums and Lemurs,' but also in *Semnopithecus cristatus*, Horsfield (*Simia cristata*, Raffles), *Cercopithecus (Macacus) cynomolgus*, Ogilby, and *Papio nemestrinus (Simia aygula)*, Ogilby. It is however difficult to recognise in preserved specimens, in which it becomes shriveled, and may therefore easily escape observation. The sexes of the present species appear not to differ in colour or size. The young ones are of the same but paler colours, and the face is blackish blue. Immediately after birth the colour is a shining fulvous. The fur consists of long soft hairs of a silky texture. This species is very common on the hills and forests of the Malayan Peninsula, Prince of Wales Island, and other neighbouring islands. The dimensions of the adult are :—

	ft.	in.
Length from the tip of the nose to the root of the tail ...	2	1½
From vertex to ditto	1	9½
Length of the arm	1	1½
—— of the hand	0	4½
—— of the leg	1	2
—— of the foot	0	6
—— of the tail	2	2½

The dentition is similar to that of *Semnopithecus maurus*, Horsfield. With old age the external margin of the iris turns gray, and forms what in the human eye is denominated *arcus senilis*. From the peculiar structure of the stomach of the *Semnopithecus*, Professor Owen has expressed an opinion, that their food consisted of leaves and tender buds of trees, rather than of fruits and roots, the food of ordinary monkeys (Zoolog. Transact. vol. i.). Dr. Horsfield has recorded that *S. maurus* during its young state feeds on tender leaves, and when adult on wild fruits (Zool. Researches in Java). The author of the above-quoted interesting work upon Monkeys (vol. i. p. 214) has pointed out the peculiarity of the molar teeth of the *Semnopithecus* being triturated at an early period, and justly infers a longitudinal grinding motion from front to rear. The present species, as well as *S. cristatus*, exhibits an additional peculiarity about the teeth, which at an early age become covered with a dark brown crust similar to that observed in ruminating animals. The food of the present species consists of leaves, tender buds of different kinds of trees as well as of soft fruit; and the occasional visits of foraging parties in nutmeg and coffee plantations and gardens is anything but welcome to the owners. In its adult state, this, like other *Semnopithecus*, is sullen and morose, and is scarcely susceptible of domestication. Such however is by no means the case during early age. A young male, some months in my possession, appeared immediately reconciled to his new mode of life, allowed himself to be handled, and showed he was not insensible of caresses. But being tied up and left in solitude he showed a gentle impatience by a most melancholy cry, repeating slowly the syllable "O O," and stretching its arms towards the nearest person, with whom he would remain quiet, frequently throwing its arms round his keeper's neck. When disturbed by a sudden movement, or when about being removed from his chosen seat, he would recommence his lamentations. In short he expressed a decided aversion to solitude and neglect. He frequently used to be in my lap or sit on my shoulder while I was reading, and as he was remarkably cleanly, these indulgences were readily granted. As already observed of others of this genus by the author of 'Nat. Hist. of Monkeys,' &c., he manifested a great indisposition to action, and

possessed none of the petulance, mischievous curiosity and restless activity of the Cercopithecus. In his predilection for the society of man, in gentleness, in his cry and also in physiognomy, he strongly resembles the Gibbons, which struck me so much the more, as I at the same time had an opportunity of studying the habits of a young *Hylobates leuciscus*, Ogilby (captured in the Purlis territory on the Malayan Peninsula, which therefore must be added to the habitats of that Gibbon). But with these points the resemblance ceases, for the latter is active, nay even remarkably so, when compared to *Semnopithecus halonifer*. A very interesting feature in this monkey is its attachment to children, whereas gibbons and monkeys, generally speaking, entertain a marked aversion towards them. The one I am now describing would go to my native butler's daughter, a little girl of five years, in preference to any other person, and cling with its arms round the child's neck as long as permitted. Leaves and young shoots* of mulberry, coffee, jambu-trees and a kind of gossypium, as well as the large pink flower of the latter, were his favourite food. Of fruit he preferred plantains, jambu and mulberries; but he would also eat mangustin, mangas, rambutan and papayas, not however unless the latter-mentioned fruits were opened or cut in small slices. But a very small quantity was taken in the mouth at a time, and in the absence of cheek-pouches it was slowly masticated and swallowed. Insects and animal food of every description he refused. Occasionally he would swallow twigs or sand. His beverage was water, which was taken after each meal in considerable quantity, and he took more fluid than solid food. He drank stooping to the water's edge, but not by means of the hand. Having finished his meal, he would sit down, close the eyelids, occasionally gnaw his fingers' ends, and slowly grind the teeth and chew very small particles of the food regurgitated under frequent eructations. Thus he would continue for a considerable time till he fell asleep. Although a rumination takes place, it is in a limited and far less degree than in Ruminants. In fact, it is, as Prof. Owen has truly suggested, "analogous to rumination" (Zool. Proceed. 1833, i. p. 75). The disparity between the extremities and the size of the stomach, which imparts a considerable corpulency even in early age, renders the monkey a ludicrous object in his awkward movements on the ground. The back is raised into a high arch, the centre of the back being elevated above the vertex, while the long hair of the head and body is

* A young male orang-outan, *Simia Satyrus*, from New Guinea (with the nails and two joints of the hind thumbs perfectly developed) greedily devours young shoots of plantain-trees and other plants, and it has therefore been found desirable to watch his rambles in my flower-garden.

disheveled. Thus he rolls heavily along to reach the nearest tree. Should the distance be found too long, he frequently rests.

In the jungle I have never observed this monkey on the ground, but troops from five or six to some twenty watch with curiosity from on high the intruder, and when frightened they will perform astounding leaps, while they express their fear or annoyance by a hoarse short cry. If one is shot, the others fly to a short distance, stop and observe the wounded, but attempt not to carry him off. Judging by the physiognomy and the proportions of the limbs, this species appears to be nearest allied to *S. maurus*, Horsfield. The white lips occur in *S. Nestor*, Bennet, but the white eyelids have hitherto been considered to be a character almost confined to certain African Cercopithecus (Nat. Hist. of Monkeys, &c., vol. i. p. 318). But *Semnopithecus cristatus* of the Malayan Peninsula and Prince of Wales Island has the eyelids of a much lighter, almost whitish, colour than the rest of the face, and in *Cercopithecus (Macacus) cynomolgus (Simia aygula)* of the same localities the upper eyelids are whitish.

The white marks however become obliterated shortly after death, and are scarcely discernible in preserved specimens. *S. halonifer* is denominated by the Malays of Prince of Wales Island by the general appellation of "Lutung" (a monkey), or "Lutung itam" (black monkey), both of which names however are also indiscriminately applied to *S. cristatus* and *S. maurus*.

Dissection of a young male of the following dimensions:—

	ft.	in.
Length from the nose to the root of the tail	1	1½
——— from vertex to ditto	0	10½
——— of the tail	1	3½

The stomach consists of three distinctly separated divisions, as described by Prof. Owen in *S. entellus*, but presents in this species a much less sacculated appearance, and differs more particularly in the second or middle compartment having smooth and not sacculated parietes, and being of a crescent shape. The pyloric portion is a cylindrical canal, gradually diminishing in diameter towards the pylorus; first of a sigmoid figure, then turning upon itself. It is in a less degree puckered up upon the two bands than is the case in the *Entellus*, and the sacculi cease about 3½ inches from the pylorus. When distended the stomach measured:—

	ft.	in.
Length along the greater curvature, beginning at the left extremity	1	3
Ditto along the less curvature	0	9
Greatest circumference one inch to the left of cardia	0	7½
Circumference one inch from pylorus	0	1½

Length of the Intestinal Canal.

	ft.	in.
Small intestines	8	0
Large ditto	1	5½
Cæcum.....	0	1½

The cæcum is of a conic figure with the fundus constricted. The liver extends from the right hypochondriac to the right lumbar region, and is nearly hidden behind the stomach. The upper surface of the right lobe adhered in this specimen firmly to the corresponding surface of diaphragma; it is of very reduced size. The gall-bladder is of a cylindric, pyriform shape, three-quarters of an inch in length. The spleen is small, triangular, somewhat flattened, measuring one inch in length, and five-eighths in its broadest diameter. The pancreas is linear, flattened, two inches in length, three-sixteenths in diameter.

Costæ veræ seven, spuria five = twelve pairs.

XLVI.—*Botanical Notices from Spain.*

By MORITZ WILLKOMM*.

[Continued from p. 270.]

No. XII. GRANADA, August 10, 1845.

SOME miles to the east of Granada lies an extensive mountain tract, consisting of limestone, which bears the name of Montes de Granada, and is formed of several mountain-chains, which have various names, although they constitute one and the same range. The Sierra de Alfacar forms the western limit of the mountains of Granada, with which the Sierra de Jarana lying behind it, about 7000 feet high, runs parallel; this is the highest part of the whole range, and forms its northern limit. With this is connected on the north several lower mountain-ranges, as the Sierra del Rallo and Sierra de las Navas, which divide the provinces of Granada and Jaen; whilst in the south, the Sierra de Jarana and the Sierra de Molinillo, and that of Alfacar pass over into the rocky Sierra de Huétor, both which are separated from the outliers of the Sierra Nevada partly by the valley of the Darro, and partly by the Rio Aucharón. This many-branched mountain district, whose vegetation varies remarkably in its different parts, divides the noble Vega de Granada from the barren and arid high plains of Guadix, and the basin of the Jenil from that of the upper Guadalquivir. I have examined this interesting district in all its parts, during several excursions, and will here endeavour to give in short sketches as true a picture as possible of its rich vegetation.

The greatest part of the whole mountain-chain is quite barren; and in the broad hollow between the Sierra de Alfacar and the first chain of the Sierra de Jarana, as well as in the valleys and ravines

* Translated from the *Botanische Zeitung*, Jan. 16, 1846.